

# NASAexplores

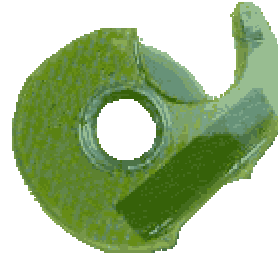
## Model Projects 2002

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### Looking for an interesting summer project?

Try building these models from the *NASAexplores* archives.

We have different types of models that you can make:



- [Space Shuttle and Spacecraft Models](#)
- [Wright Flyer and Aircraft Models](#)
- [Science and Other Models](#)



National Aeronautics and  
Space Administration



[www.NASAexplores.com](http://www.NASAexplores.com)

## Model Projects 2002: Space Shuttle and Spacecraft

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### Space Shuttle Models

#### *My Future Space Shuttle* (K-4)

Design a model of what the future Space Shuttle could look like.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

#### *Shuttle 'Copter* (K-4)

Build a spiraling Shuttle 'Copter.

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#### *Space Shuttle Glider* (5-8)

Build a paper model of the Shuttle.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

#### *Did you know that...*

The Space Shuttle is the world's first reusable spacecraft, and the first spacecraft in history that can carry large satellites both to and from orbit. The Shuttle launches like a rocket, maneuvers in Earth orbit like a spacecraft and lands like an airplane. Each of the four Space Shuttle orbiters now in operation--Columbia, Discovery, Atlantis and Endeavour--is designed to fly at least 100 missions.



## Shuttle-related Models

### *Parachutes And Parafoils* (9-12)

Build and test models of parachutes and parafoils.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### *Shuttle Drag Parachute* (K-4)

Construct and test a parachute.

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### *Speed Brake* (5-8)

Build a paper model of the Shuttle that demonstrates a speed brake.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

## Other Spacecraft Models

### *Bottle Rocket* (5-8)

Construct a simple bottle rocket.

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### *Satellite Missions* (5-8)

Build a satellite model.

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## Spacecraft-related Models

### *Crash And Not Smash?* (5-8)

Construct and test a parafoil.

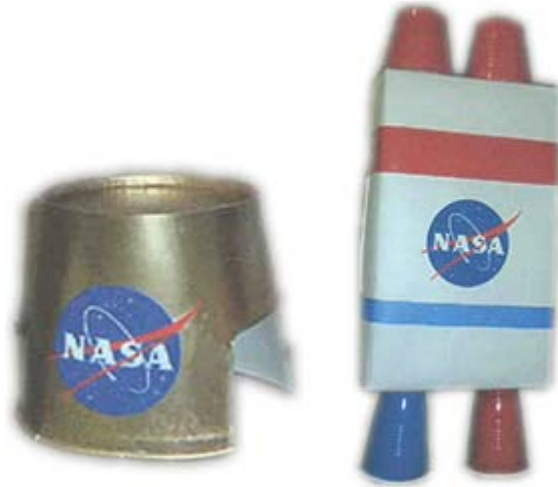
[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]



***Egg Drop Lander Contest*** (9-12)

Design and build an egg drop lander.

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***Space Walking In Style*** (K-4)

Construct a helmet and backpack to simulate a spacesuit.

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## Model Projects 2002: Aircraft and Aviation

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### Wright Flyer Models



#### *The 1903 Flyer (5-8)*

A replica of the Wright Flyer made from styrofoam meat trays, popsicle sticks and toothpicks.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

#### *Eat Wright (K-4)*

Build an edible model of the Wright brothers' first airplane.

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#### *Did you know that...*

- Wilbur and Orville Wright flipped a coin on December 14<sup>th</sup>, 1903, to see who would be the first to fly. Wilbur won the toss. That first flight was unsuccessful, and Orville would have the honor of making the first powered flight on December 17<sup>th</sup>.

- Orville and Wilbur never married. Wilbur said that he didn't have time for both a wife and an airplane.

## Aircraft Models

### *Air Power* (9-12)

Use balloons to model a rocket engine.

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### *Changing Wings* (K-4)

Build a styrofoam glider and test different wing shapes.

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### *Collapsible-Wing Airplane* (K-4)

Construct and deploy a collapsible-wing airplane out of common household items.

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### *Flight Model* (5-8)

Learn how to change the flight characteristics of a glider made from styrofoam and toothpicks.

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### *Flying Wing* (5-8)

An acrobatic flying wing made from plastic foam trays.

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### *Glider Characteristics* (5-8)

Build and test a glider made from styrofoam and toothpicks.

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### *Paper Winglets* (9-12)

Test the effects of winglets using a paper airplane.

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### *Right Flight* (K-4)

Construct a styrofoam glider and determine its weight and balance.

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### *The Right Weight* (K-4)

Identify the center of gravity for a glider and test the effects adding weight will have on its flight characteristics.

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### ***Rotor Motor*** (K-4)

Construct a paper rotary wing model.

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### ***Testing Aircraft Design*** (9-12)

Design and build a paper, cardboard, or balsa wood plane.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***Wing Designs*** (5-8)

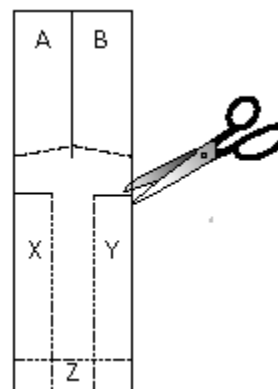
Test different wing designs on a glider made from styrofoam and toothpicks.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***Winglet Or Not?*** (K-4)

Test the effects of winglets using a styrofoam airplane.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]



## **Aircraft-related Models**

### ***Build a Table-Top Airport*** (5-8)

Build an airport using cardboard boxes.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***Frosty*** (9-12)

Model how ice builds up on airplane wings.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***Let's Build a Table-Top Airport*** (K-4)

Build an airport using cardboard boxes.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***Wind Tunnel Model*** (5-8)

Build a functioning wind tunnel.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***Wind Tunnel Model*** (9-12)

Build a functioning wind tunnel.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]



## First Powered Flight

By **June 1903**, Orville and Wilbur Wright had finished designing and building their powered machine. The Flyer had a wingspan of a little more than 40 feet (12 meters), a surface area of 510 square feet (47 square meters), and weighed 625 pounds (283 kilograms). They constructed as much of the Flyer as they could in Dayton, Ohio; then shipped the parts to Kitty Hawk for final assembly.

The brothers arrived at Kitty Hawk **September 25<sup>th</sup>** and spent the next two months working on the Flyer. It was ready for flight on December 12, but the winds were too light to take off. They did not attempt a flight on Sunday, since they had promised their father they would not fly on the Sabbath.

Their first attempt at powered flight took place Monday, **December 14<sup>th</sup>**. The Flyer climbed a few feet, stalled, and then settled onto the ground near the foot of the hill. The machine was damaged slightly. Repairs would take two days.

On **December 17<sup>th</sup>**, the weather was rough—rain and strong winds. The brothers decided to go ahead despite the wind about 10:00 a.m. The first flight lasted 12 seconds and went about 120 feet (36.6 meters). The second flight, at 11:20, went 175 feet (53 meters); the third flight, at about 11:40, was about 200 feet (61 meters) long.

The fourth flight took off around noon with Wilbur at the controls. The flight began like the others—with the Flyer pitching upward and down. After about 300 feet (91 meters), Wilbur got it under control and began traveling on a fairly even course. He proceeded this way until he was around 800 feet (244 meters) out. Then the Flyer began bucking again and suddenly plunged into the ground. The front rudder frame was badly broken, but the main frame was intact. It had traveled 852 feet (260 meters) in 59 seconds.

Unfortunately, a gust of wind flipped the Flyer over and destroyed it. It had accomplished a milestone, but would never fly again. The brothers would ship the remains home to Dayton.

*For more information and historic photos, see the U.S. Centennial of Flight Commission page on the [First Powered Flight, 1903](#)*





## Model Projects 2002: Science and Other Models

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### Science Models

#### *Blood Pressure* (9-12)

Build a simple model that replicates blood pressure.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

#### *Cartesian Divers* (5-8)

Build cartesian divers using condiment packets.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

#### *Early Clocks* (K-4)

Build a water clock using two small cups.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

#### *Greenhouse Effect* (K-4)

Observe temperature differences in a greenhouse model made from 2-liter bottles.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

#### *Hydrologic Cycle, The* (9-12)

Build a model of the hydrologic cycle in a two-liter bottle.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

#### *Model of Electromagnetic Spectrum* (9-12)

Build a model of the electromagnetic spectrum using pasta.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]





### ***Slithering Sidewinding Snakes* (5-8)**

Build a snake using styrofoam cups.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***Slithering snakes* (K-4)**

Build a snake using styrofoam cups.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***Sticks And Stones Can Break A Bone* (K-4)**

Make a skeleton model out of cotton swabs.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***Water Clocks* (5-8)**

Build a water clock using two small cups.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

### ***What Is A Fossil?* (5-8)**

Make a fossil mold and cast.

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## **Solar System**

### ***Earth, Moon, and Mars Balloons* (5-8)**

Model the solar system with balloons.

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### ***Planet Bracelet, A* (K-4)**

Build a bracelet model of the solar system.

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### ***Sun, The* (K-4)**

Build a pom-pom model of the solar system.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]



# Robotics

## *Robotic Probe Model* (5-8)

Research and build a model of a robot probe.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

# Safety

## *Egg Helmets* (5-8)

Design and build a helmet to protect an egg from a fall.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]



## *Hey! Watch Out For My Head* (9-12)

Design and build a helmet to protect an egg from a fall.

[ [Teacher Sheets](#) ] [ [Student Sheets](#) ] [ [Printer-Friendly Version](#) ]

# Transportation

## *My Big Rig* (K-4)

Build a truck that has an aerodynamic fairing out of juice cartons.

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## *Sailing In The Wind* (K-4)

Make a foam-cup sailboat and see how wind affects the movement of the sailboat in the water.

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